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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,523	07/16/2004	Shuichiro Kato	49677-158	4667
<div>7590 12/29/2006 McDermott Will & Emery 600 13th Street NW Washington, DC 20005-3096</div>			<div>EXAMINER EDEL, JOHN B</div> <div>ART UNIT 1731 PAPER NUMBER</div>	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/29/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No. 10/501,523	Applicant(s) KATO ET AL.	
	Examiner John B. Edel	Art Unit 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

(1)

Hereinafter, the numbers formatted as "**26**" will refer to a claim number in the application, and information in brackets, "[...]" will refer to prior art.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim **1 and all claims depending therefrom** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The number of glass bodies in claim 1 is indefinite because the language does not make clear how many glass bodies are referred to in the claim. The claim refers to "a glass body" followed by "said glass body" followed by "a columnar or cylindrical glass body." The third reference could be interpreted as introducing an additional glass body and is therefore indefinite.

Claim **9 and all claims depending therefrom** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The number of glass bodies in claim 9 is indefinite because the language does not make clear how many glass bodies are referred to in the claim. The claim refers to "a glass body" followed by "a cylindrical glass body." The second reference could be interpreted as introducing an additional glass body and is therefore indefinite.

Claim **17 and all claims depending therefrom** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The number of glass bodies in claim 17 is indefinite because the language does not make clear how many glass bodies are referred to in the claim. The claim refers to "a glass body" followed by "a columnar or cylindrical glass body" followed by "said glass body." The second reference could be interpreted as introducing an additional glass body and is therefore indefinite. For the purposes of compact prosecution all of the above ambiguities relating to the number of glass bodies will be interpreted as requiring only a single glass body.

Claim **5** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by "applied to an entirety" in claim 5. The specification does not define "applied to an entirety" and one having ordinary skill in the art of glass purification would not be apprised of meaning of the phrase.

Claims **5-7 and 13-15** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the claims require *the* voltage to be applied in a longitudinal or radial direction.

Claim **20** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. Claim 20 claims multiple methods making it unclear which method or combination thereof is claimed.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: how the method steps of the two disclosed methods are related.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the electrodes are contacting the surface of the glass body as indicated in claim 17 or not contacting the surface as indicated in claim 20.

Claim Rejections - 35 USC § 103

(2)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims **1, 9, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,096,479 to Allen ("Allen"). Allen discloses applying a voltage on a glass **1, 9, 17, 55, 57, 59, 61, 63, & 65** [abstract] from at least one pair of electrodes **1, 9, 17, 55, 57, 59, 61, 63, & 65** [abstract]. Allen teaches that it is known in the prior art to move alkali metal impurities within a glass body by applying a difference in electrical potential between two points on the glass and that doing so is desirable because those impurities may be later removed yielding a more pure form of glass. One having ordinary skill in the art of glass making would understand that these teachings could be applied in a very large number of ways to a cylindrical glass bodies **1, 9, 17, 55-61, 63, & 65** [col. 1 line 60 to col. 2 line 5; col. 5 lines 20-35] including electrodes on the interior and exterior of the tube (radial arrangement) **9, 57, & 63** [figure 1] electrodes on the exterior of the tube **1, 55, & 61** [col. 1 lines 30-50] and electrodes on the tube which are displaced from each other longitudinally along a tube **17, 59, & 65** [col. 1 lines 30-50]. Allen also teaches the slow rotation of the glass in a lathe [example 1]. One having ordinary skill in the art would recognize slow rotation either includes or makes obvious rotation speeds between 1 and 100 RPM **9** [example 1] and between 1 and 20 RPM **10** [example 1]. Therefore, it would have been obvious at the time of the invention to use the teachings of Allen to obtain the invention as specified in claims **1, 9, and 17**.

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Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allen as applied to claim 1 above, and further in view of *In Re Harza*¹ which teaches that the duplication of parts does not give patentable significance absent a demonstration of unexpected results. The provision of multiple electrodes arranged circumferentially 2 qualifies as a duplication of parts. Therefore, it would have been obvious at the time of the invention to use the teachings of Allen to obtain the invention as specified in claim 2.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allen as applied to claim 1 above, and further in view of Allen's of rotation on the lathe 3 [col. 2 lines 65-68], because circumferential swinging is a type of rotation 3 [col. 2 lines 65-68] and because providing continuous rotation without a reversal in direction (swinging) would be undesirable in certain situations. For example, continuous rotation could twist up wires associated with the electrodes. Therefore, it would have been obvious at the time of the invention to use the teachings of Allen to obtain the invention as specified in claim 3.

Claims 4, 8, 11, 12, 16, and 18-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen as applied to claims 1, 9, and 17 above, and further in view of Allen's disclosure of: removing the outer surface of glass bodies after the application of a voltage 4 [col. 1 lines 30-50]; voltage being applied to more than 500 mm of glass 8,

¹ From MPEP §2144.04 regarding the **Duplication of Parts**:

In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) (Claims at issue were directed to a water-tight masonry structure wherein a water seal of flexible material fills the joints which form between adjacent pours of concrete. The claimed water seal has a "web" which lies ** in the joint, and a plurality of "ribs" ** >projecting outwardly from each side of the web into one of the adjacent concrete slabs. <The prior art disclosed a flexible water stop for preventing passage of water between masses of concrete in the shape of a plus sign (+). Although the reference did not disclose a plurality of ribs, the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced.).

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16, & 49-51 [figure 1 and col. 2 lines 65-68]; removing an outer layer of the glass body to remove impurities 11, 12 & 18 [col. 1 lines 30-50]²; one having ordinary skill in the art of glass purifying would recognize that the invention of Allen could apply to any length of glass body 19 [figure 1]; the electrodes as either being in contact with the glass body or not being in such contact depending on what part of the invention is classified as the electrode³ 20-22 [figure 1]; the electrodes as gaseous and contacting the glass body 23-25 [col. 2 lines 1-35; col. 2 lines 1-10]; the voltages being applied while heating the glass body to a temperature below 1450°C 26 & 27 [col. 1 lines 5-20], below 1300°C 28-30 [col. 1 lines 5-20], higher than 450°C 20 & 31-35 [col. 1 lines 5-20], higher than 600°C 36-40 [col. 1 lines 5-20], and higher than 900°C 41-45 [col. 1 lines 5-20]; a content concentration of impurity cations is reduced to less than 0.01 ppm 46-48 [Examples 1 and 2]. Therefore, it would have been obvious based on the teachings of Allen to obtain the invention as specified in Claims 4, 8, 11, 12, 16, and 18-48.

Claims 49-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen as applied to claims 1, 9, and 17 above, and further in view of Allen's disclosure of example 3 therein. It would be obvious to use larger diameter tubes because Allen discloses the use of Allen's invention on a crucible of substantial comparative diameter. Therefore, it would have been obvious based on the teachings of Allen to provide a glass body of greater diameter than 100 mm to obtain the invention as specified in Claims 49-51. Allen further discloses a content concentration of impurity cations is

² Allen discloses removing the portion of the glass that the impurities moved to during the application of the voltage followed by removal of the impurities. It would be obvious to remove the impurities regardless of configuration of the electrodes and the final location of the impurities.

³ The "electrodes" as claimed may be viewed as either the gaseous electrodes as taught in Allen or metallic/carbon electrodes taught in Allen.

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reduced to less than 0.01 ppm 52-54 [Examples 1 and 2]. Therefore, it would have been obvious based on the teachings of Allen to provide a glass body of greater diameter than 100 mm to obtain the invention as specified in Claims 49-54.

(3)

Claim 55-61, 63, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen as applied to claims 1, 9, and 17 above, and further in view of United States Patent No. 5,837,334 to Yokokawa ("Yokokawa"). Allen further discloses: heating the glass body 55, 57, 59, 61, 63, & 65 [col. 1 lines 5-20]. Yokokawa discloses what Allen fails to disclose expressly, that a boring jig may be contacted with the glass body to form the glass body into a glass tube 55 [col. 7 line 45 to col. 8 line 10; figure 6] and that there is a heating element 61, 63, & 65. Allen and Yokokawa are analogous because both relate to forming high purity quartz glass components. It would be obvious to combine the boring method of Yokokawa with the purifying methods disclosed in Allen because large cost savings (from reduced heating cost) could result from not having to heat the quartz glass multiple times for the separate steps. Therefore, it would have been obvious to combine Allen with Yokokawa to obtain the invention as specified in Claim 55-61, 63, & 65. It would be further obvious upon the combination of Allen and Yokokawa to use the boring jig as the electrode because doing so would be more efficient than having a separate electrode 63.

(4)

Claims **62, 64, and 66** are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen and Yokokawa as applied to claims 61, 63, and 65 above, and further in view of United States Patent No. 5,599,144 to Bickham ("Bickham"). Bickham discloses what Allen and Yokokawa fail to disclose expressly, that silicon carbide may be used as a surface treatment on the boring jig. Bickham and Yokokawa are analogous because Bickham relates to a problem to be solved by Yokokawa, namely what type of carbon drill to use. It would be obvious to combine the drill bit of Bickham with the boring and treating methods of Allen and Yokokawa because Bickham reveals several advantages to the silicon carbide drill bits such as long life and quality holes. Therefore, it would have been obvious to combine Bickham with Allen and Yokokawa to obtain the invention as specified in Claim **62, 64, and 66**.

Conclusion

(5)

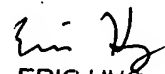
Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Edel whose telephone number is (571) 272-4804. The examiner can normally be reached on 8:30 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven P. Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JBE


ERIC HUG
PRIMARY EXAMINER